EXPERIMENTS, AND OBSERVATIONS, About the Mechanical Production OF TASTS.

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EXPERIMENTS, AND OBSERVATIONS, About the Mechanical Production OF TASTS.

TO make out the Mechanical Origine or Production of *Sapors*, as far as is neceſſary for my preſent purpoſe, 'twill be expedient to premiſe in general, that, according to our notion of Taſts, they may depend upon the bigneſs, figure and motion of the ſaporifick corpuſcles, conſidered ſeparately, and as the affections of ſingle and very minute particles of matter; or elſe in a ſtate of conjunction, as two or more

of these affections, and the particles they belong to, may be combined or associated, either among themselves, or with other particles, that were not saporous before. And as these Coalitions and other Associations come to be diversified; so the Tasts, resulting from them, will be altered or destroyed.

But, to handle these distinctly and fully, were a task not onely too difficult and long, but improper in this place, where I pretend to deliver not Speculations, but matters of Fact: in setting down whereof nevertheless, to avoid too much confusion, I am content, where I can doe it readily and conveniently, in some of my Trials, to couch such references as may best point at those Heads, whence the Mechanical explications may be derived, and consequently our Doctrine confirmed.

By Tast considered as belonging to the Object, (under which Notion I here treatof it,) I mean that quality, or whatever else it be, which enables

bles a body by its operation, to produce in us that ſenſation, which we feel or perceive when we ſay we *taſte*.

That this ſomething, whether you will call it a quality, or whatever elſe it be that makes or denominates an object *ſaporous*, or rather (if I may be allowed a barbarous term) *ſaporifick*, may ſo depend upon the ſhape, ſize, motion, and other Mechanical affections of the ſmall parts of the taſted body, and reſult from the aſſociation of two or more of them, not excluding their congruity or incongruity to the organs of Taſting, may be made probable by the following Inſtances.

EXPER. I.

To divide a Body, almoſt inſipid, into two Bodies of very ſtrong and very differing Taſts.

THIS obſerved, that Salt-peter refined, and by that purification freed from the Sea-ſalt that is wont to be mingled with it, does rather cool the tongue, than make any great ſaporifick impreſſions on it. And though I will not ſay, that it is, as ſome have thought, an inſipid body; yet the bitteriſhneſs, which ſeems to be its proper taſt, is but very faint and languid. And yet this almoſt inſipid body, being diſtilled by the way of Inflammation, (which I elſewhere teach,) or even by the help of an additament of ſuch clay as is it ſelf a taſtleſs body, will afford a Nitrous ſpirit, that is extreamly ſharp or corroſive upon the tongue, and will diſſolve ſeveral Metals themſelves, and a fixt ſalt, that is likewiſe

wise very strongly tasted, but of a tast altogether different from that of the Spirit, that is extreamly sharp or corrosive upon the tongue; and accordingly, this salt will dissolve divers compact bodies that the other will not work on, and will precipitate divers metals and other concretes out of those solutions, that have been made of them by the Spirit.

EXPER. II.

Of two Bodies, the one highly Acid and corrosive, and the other Alkalizat and fiery, to produce a Body almost insipid.

THis may be performed by the way I have elsewhere mentioned of composing Salt-peter. For if upon a liquour of fixt Nitre, made *per Deliquium*, you warily drop good Spirit of Nitre, till it be just enough to satiate the Alkaly, (for if there

be too much or too little, the Experiment may miſcarry,) we may by a gentle evaporation, and ſometimes without it, and that in a few minutes, obtain Cryſtals, which, being dried after they have been, if it be needfull, freed from any adhering particles, (not of their own nature,) will have upon the tongue neither a ſharp nor an alkalizate taſt, but that faint and ſcarce ſenſible bitterneſs that belongs to Salt-peter, if it be pure Salt-peter; for the impure may perhaps ſtrongly reliſh of the common Salt that is uſually contained in it.

The like production of Salt-peter we have ſometimes made in far leſs time, and ſometimes indeed in a trice, by ſubſtituting, in ſtead of the fixed Salt of Nitre, the ſaline parts of good Pot-aſhes, carefully freed by ſolution and filtration from the earthy and feculent ones.

I have ſometimes conſidered, whether the *Phænomena* of theſe two Experiments may not be explicated by ſuppoſing them to ariſe from the new mag-

magnitudes and figures of the particles, which the fire, by breaking them, or forcibly rubbing them one againſt the other, or alſo againſt the Corpuſcles of the additament, may be preſumed to give them; as if, for example, ſince we find the larger and beſt formed Cryſtals of Nitre to be of a priſmatical ſhape with ſix ſides, we ſhould ſuppoſe the corpuſcles of Nitre to be little priſms, whoſe angles and ends are too obtuſe or blunt to make vigorous and deep impreſſions on the tongue; and yet, if theſe little priſms be by a violent heat ſplit, or otherwiſe broken, or forcibly made as it were to grind one another, they may come to have parts ſo much ſmaller than before, and endowed with ſuch ſharp ſides and angles, that, being diſſolved and agitated by the ſpittle that uſually moiſtens the tongue, their ſmalneſs may give them great acceſs to the pores of that organ, and the ſharpneſs of their ſides and points may fit them to ſtab and cut, and perhaps ſear the nervous and

and membranous parts of the organ of Taſt, and that variouſly, according to the grand diverſities, as to ſhape and bulk, of the ſaporifick particles themſelves. And this being granted, it ſeemed further conceivable, that when the Alkalizate and Acid particles come to be put together in the fluid mixture, wherein they ſwam, many of them might, after a multitude of various juſtlings and occurſions, meet with one another ſo luckily and opportunely, as to recompoſe little priſms, or convene into other bodies, almoſt like thoſe that made up the Cryſtals of Nitre, before 'twas expoſed to the fire. To illuſtrate which, we may conceive, that, though a priſm of iron may be ſo ſhaped, that it will be wholly unfit to pierce the skin; yet it may be ſo cut by tranſverſe planes reaching to the oppoſite *baſes* or ends, as to afford wedges, which, by the ſharpneſs of their edges, may be fit both to cleave wood, and cut the skin; and theſe wedges, being again put together after a requiſite

quiſite manner, may recompoſe a priſm, whoſe extreams ſhall be too blunt to be fit for the former uſe. This may be alſo illuſtrated by the breaking of a dry ſtick circularly cut off at the ends, which though it is unapt, whilſt intire and of that bulk, to prick the hand; yet if it be violently broken, the ragged ends of it and the ſplinters may prove ſtiff, ſlender, and ſharp enough to pierce and run into the hand: To which divers other ſuch Mechanical Illuſtrations might be added. But, ſince I fear you think, as well as I, the main conjecture may not be worthy any farther proſecution, I ſhall not inſiſt any longer on it. And becauſe the hiſtorical part of theſe Experiments was for the main delivered by me already in the Eſſay about the *Analyſis* and Redintegration of Nitre, I ſhall now proceed to other Trials.

EXPER.

EXPER. III.

Of two Bodies, the one extreamly bitter, and the other exceeding ſalt, to make an inſipid mixture.

TO make this Experiment, we muſt very warily pour upon Cryſtals made of Silver, diſſolved in good Aqua fortis or Spirit of Nitre, ſtrong brine made of common ſalt and water. For the mixture of theſe two being dried, and afterwards brought to fuſion in a Crucible, and kept a competent while in that ſtate, will afford a tough maſs, the Chymiſts call *Luna Cornea*, which you may lick divers times, and ſcarce judge it other than inſipid; nor will it eaſily be brought to diſſolve in much more piercing Menſtruums than our ſpittle, as I have elſewhere ſhewn.

EXPER.

EXPER. IV.

Of two Bodies, the one extreamly ſweet, and the other ſalter than the ſtrongeſt Brine, to make an inſipid mixture.

THE doing of this requires ſome skill and much wariness in the Experimenter, who, to perform it well, muſt take a ſtrong ſolution of *Minium*, made with an appropriated Menſtruum, as good Spirit of Vinegar, or elſe *Saccharum Saturni* it ſelf, diſſolved in a convenient Vehicle; and then muſt have great care and caution to put to it, by degrees, a juſt proportion of ſtrong Spirit of Sal Armoniac, or the like Urinous Spirit, till the whole be precipitated; and if the two former taſts are not ſufficiently deſtroyed in the mixture, it may be dried and fluxed, as was above directed about *Luna Cornea*.

EXPER.

EXPER. V.

Of an insipid Body and a sour one, to make a Substance more bitter than Gall or Aloes.

THis is easily performed by dissolving in strong Spirit of Nitre or good Aqua fortis as much pure Silver as the Menstruum will take up; for, this solution being filtrated, has been often esteemed more bitter than so much Gall or Wormwood, or any other of those simples that have been famous for that quality: And if the superfluous moisture be abstracted, you may by coagulation obtain Crystals of Luna, that have been judged more strongly bitter than the solution it self. And that the corpuscles of these Crystals should leave a far more lasting tast of themselves, than the above-mentioned bitter bodies are wont to doe, will not seem so marvellous, as I remember some that tried have complained; if we take

take notice, how deep the particles of theſe Cryſtals may pierce into the ſpungy organs of Taſt, ſince, if one does but touch the pulp or nail of ones finger, (firſt a little wetted with ſpittle or otherwiſe,) with the powder of theſe Cryſtals, they will ſo penetrate the skin or nail, and ſtick ſo faſt there, that you cannot in a reaſonable time waſh the ſtain off of the skin, and much leſs off of the nail, but it will continue to appear many hours on the former, and many days on the other.

EXPER. VI.

Of an inſipid Body and a highly corroſive one, to make a Subſtance as ſweet as Sugar.

THis is eaſily done, by putting upon good Minium purified Aqua fortis or Spirit of Nitre, and letting them work upon one another in a gentle heat, till the liquour have diſſol-

dissolved its full proportion of the metal. For then, if the ingredients were good, and the operation rightly performed, the Menstruum would have a sweetness like that of ordinary *Saccharum Saturni*. But 'twas not for nothing that I intimated, the ingredients should be also pure and good in their kind; for, if the *Minium* be adulterated, as often it is, or the Spirit of Nitre or Aqua fortis be mingled, as it is usual before it be purged with Spirit of common Salt or other unfit ingredients, the operation may be successless, as I have more than once observed.

EXPER. VII.

Of obtaining without addition from the sweetest Bodies, Liquours corrosive enough to dissolve Metals.

IF Sugar be put into a sufficiently capacious Retort, and warily distilled, (for otherwise it will be apt to

to break the Veſſel) it will afford, among other things, a copious red Spirit, which, being ſlowly rectified, will loſe its colour, and come over clear. The *Caput Mortuum* of the Sugar, which I have more than once had of an odd Contexture, may be found either almoſt or altogether inſipid. And though the Spirit will be of a very penetrant taſt, yet it will be very far from any kind of ſweetneſs; and though that liquour be thought to be homogeneous, and to be one of the Principles of the analized Sugar, yet (as I have elſewhere ſhewn) I found it to be a mixture of two Spirits; with the one of which, beſides bodies of a leſs cloſe Texture, I diſſolved (even in the cold) crude Copper, as was eaſie to be ſeen by the deep and lovely colour of the ſolution. And to theſe four Spirits, afforded by Sugar it ſelf, we have reſtored a kind of Sacchaine ſweetneſs, by compounding them with the particles of ſo inſipid a body as Minium; part of which

they will in digeſtion diſſolve. A like Spirit to that diſtilled from Sugar may be obtained from *Honey*; but in regard of its aptneſs to ſwell exceedingly, Chymiſts are not wont to diſtill it without Sand, Brick, or ſome other additament.

EXPER. VIII.

To divide a Body, bitter in the higheſt degree, into two Subſtances, the one extreamly ſour, and the other perfectly inſipid.

THis is eaſily done by putting ſome fine Cryſtals of *Lunæ* into a good Retort, and then diſtilling them in a Sand-furnace, capable of giving them ſo ſtrong a fire, as to drive away all the ſpirits from the Silver. For, this remaining behind, according to its metalline nature, will be inſipid, and the ſpirits, that are driven away from it, will unite in the Receiver into an acid and corroſive Menſtruum. EX-

EXPER. IX.

To produce variety of Tasts in one insipid Body, by associating it with divers Menstruums.

AS this operation may, upon the account I elsewhere mention, be serviceable to investigate the figures of the particles of dissolved metals and other bodies; so 'tis very fit to manifest, what we would here have it shew, how much Tast may be diversified by, and consequently depend upon, Texture; since a body that has no tast, may, in conjunction with sapid bodies, give them strong tasts all differing from one another, and each of them from that which the saporous bodies had before. I could propose divers ways of bringing this to trial, there being several insipid bodies, which I have found this way diversifiable. But because I remember not, that I have met with any mineral, that is

diſſoluble by near ſo many ſaline Menſtruums, as Zinke, I look on that as the moſt fertile Subject to afford Inſtances to our preſent purpoſe. For I have found, that it will be diſſolved not onely by Aqua fortis, Aqua Regis, Oil of Vitriol, Spirit of Nitre, Spirit of Salt, and other mineral Menſtruums, but alſo by Vegetable Spirits, as diſtilled Vinegar, and by Animal ones too, as Spirit of Sal Armoniac; though the one be Acid, and the other Urinous. And if the ſeveral Solutions, which may be made of this mineral, by ſo many differing liquours, be compared, the number of their differing taſts will ſuffice to make good the Title of the Experiment.

EXPER. X.

To produce variety of Tasts with one Menstruum, by associating it with insipid Bodies.

THis Proposition a Mathematician would go near to call the Converse of the foregoing; and as it may serve as well as that to discover the structure of the minute parts of divers metalline and mineral bodies; so it may not onely as well, but better than that, serve us to illustrate the Corpuscularian Doctrine of Tasts, by shewing us, that a single, and, as far as Chymistry teaches us, a simple body, endowed with a peculiar tast, may, by being compounded with others, each of them insipid of it self, produce a considerable number of differing tasts. There may be more Instruments than one made use of in this Trial; but of those that are known, and we may easily obtain, the most proper are Spirit of Nitre,

and good Aqua fortis: For that, with refined *Silver*, will make a Solution bitter as Gall; with *Lead*, 'twill be of a Saccharine ſweetneſs; with that part of *Tin*, which it will keep diſſolved, (for the greateſt 'tis wont but to corrode and præcipitate) it produces a taſt very diſtant from both the former, but not odious; with *Copper*, it affords an abominable taſt; with *Mercury* and *Iron*, it affords other kinds of bad Taſts. Nor are Metals the onely mineral bodies it will work upon: For, 'twill diſſolve Tin-glaſs, Antimony, Braſs; to which I could add Emery, Zinke, and other bodies whereon I have tried it. All which together will make up no deſpicable number of differing Taſts.

EXPER. XI.

Of two Liquours, the one highly corroſive, and the other very pungent and not pleaſant, to compoſe a Body of a pleaſant and Aromatick Taſt.

THis Experiment, which I elſewhere mention to other purpoſes, does in ſome regards better ſuit our preſent deſign, than moſt of the foregoing; ſince here the Corroſive Menſtruum is neither mortified by fixt nor urinous Salts, ſuppoſed to be of a contrary nature to it; nor yet, as 'twere, tired out nor diſarm'd by corroding of metals or other ſolid bodies. The Experiment being ſomewhat dangerous to make at firſt in great, it may ſuffice for our preſent turn, to make it in the leſs quantity, as follows.

Take one ounce of ſtrong Spirit of Nitre, or of very good Aqua fortis it ſelf, and put to it by little and little, (which caution if you neglect, you

may ſoon repent it,) and another ounce of ſuch rectified Spirit of Wine, as, being kindled in a Spoon, will flame all away: When theſe two liquours are well mixt, and grown cold again, you may, after ſome digeſtion, or, if haſt require, without it, diſtill them totally over together, to unite them exquiſitly into one liquour, in which, if the operation have been well performed, the corroſive particles of the Salts will not onely looſe all their cutting acidity, wherewith they wounded the palat; but by their new compoſition with the Vinous Spirits, the liquour acquires a Vinous taſt, that is not onely not acid or offenſive, but very pleaſing, as if it belonged to ſome new or unknown Spice.

EX-

EXPER. XII.

To imitate by Art, and sometimes even in Minerals, the peculiar Tasts of natural Bodies, and even Vegetables.

THis is not a fit place to declare, in what sense I do or do not admit of Souls in Vegetables, nor what I allow or deny to the Seminal or Plastick principle ascribed to Plants: But perhaps it will not be erroneous to conceive, that, whatever be the Agent in reference to those Tasts, that are said to be specifick to this or that Plant, that, on whose immediate account it is or becomes of this or that nature, is a complication of Mechanical Affections, as shape, size, *&c.* in the particles of that matter which is said to be endowed with such a specifick tast.

To illustrate this, I thought it expedient, to endeavour to imitate the tast of some Natural bodies by Artificial

cial Compoſitions or Preparations, but found it not eaſie, beforehand to be aſſured of the ſucceſs of ſuch Trials: And therefore I ſhall content my ſelf here to mention three or four Inſtances, that, except the firſt, are rather Obſervations than ſuch Experiments as we are ſpeaking of.

I remember then, that, making ſome Trials to alter the ſenſible Qualities of Smell, Taſt, &c. of Oil of Vitriol, and Spirit of Wine, I obtained from them, among other things that ſuited with my deſign, a certain Liquour, which, though at firſt pleaſant, would, at a certain nick of time, make one that had it in his mouth think it had been imbued with Garlick.

And this brings into my mind, that a skilful perſon, famous for making good Sider, coming one day to adviſe with me, what he ſhould doe to heighten the taſt of it, and make it keep the longer, complained to me, that having, among other trials, put into a good Veſſel full of juice of

Apples

Apples a certain proportion of Muſtard-ſeed, with hopes it would make the Sider more ſpirituous and pickant, he found, to his wonder and loſs, that, when he came to draw it, it ſtank of Garlick ſo rank, that every body rejected it.

I remember alſo, that, by fermenting a certain proportion (for that we found requiſite) of *ſemen Dauci* with Beer or Ale, the Liquour had a very pleaſant Reliſh of Limon-pills.

But that ſeems much more conſiderable, which I ſhall now add; That, with an inſipid Metal and a very corroſive Menſtruum, one may compound a taſt, that I have ſeveral times obſerved to be ſo like a Vegetable, that I preſume it may deceive many. This may be done by diſſolving Gold, without any groſs Salt, in the mixture of Aqua fortis and the Spirit of Salt, or even in common Aqua Regis, made by diſſolving Sal Armoniac in Aqua fortis. For if the Experiment be happily made, one may obtain either a Solution or a Salt,

Salt, whose austere taste will very much resemble that of Sloes, or of unripe Bullace. And this taste, with some little variety, I found in Gold dissolved without any distilled Liquour at all; and also, if I much forget not, in Gold that by a peculiar Menstruum I had volatilized.

The last Instance I shall give of the imitation of Tasts, I found to have been, for the main, known to some ingenious Ladies. But to make the Experiment succeed very well, a due proportion is the principal Circumstance, which is wont to be neglected. I cannot readily call to mind that which I found to succeed best; but the Trial may be indifferently well made after such a manner as this:

Take a pint or a pound of *Malaga* or *Canary* Sack, (for though *French* and the like Wines may serve the turn, yet they are not so proper;) and put into it a drachm or two of good odoriferous Orrice Roots, cut into thin slices, and let them infuse in

in the Liquour a convenient time, 'till you perceive that they have given it a desired taſt and ſmell; then keep the thus perfumed Wine exactly ſtopped in a cool place: According to which way, I remember, that (when I hit on the right proportion of Ingredients, and kept them a due time in infuſion) I had many years ago a Wine, which, being coloured with *Cocheneele*, or ſome ſuch tingeing ingredient, was taken for good Raſberry-Wine, not onely by ordinary perſons, but, among others, by a couple of eminent Phyſicians, one of whom pretended to an extraordinary criticalneſs of palate on ſuch occaſions; both of them wondering, how at ſuch an unlikely time of the year, as I choſe to preſent them that Liquour among others, I could have ſuch excellent Raſberry-Wine: Some of which (to add that by the by) I found to preſerve the ſpecifick taſt two or three years after it was made.

A Short

EXCURSION

About some Changes made

OF

TASTS

BY

MATURATION.

IT will not perhaps be thought impertinent, but rather necessary, to add a word or two on this occasion for their sakes, that think the Maturation of Fruits, and the changes of Tasts, by which 'tis usually known, must needs be the effect of the Vegetable Soul of the Plant. For, after the Fruit is gathered, and so, by being no longer a part of the Tree, does,

does, according to the most common opinion, cease to be a part of the living Plant, as a Hand or a Foot cut off is no more reckoned among the Lims of the man it belonged to; yet 'tis very possible that some Fruits may receive maturation, after they have been severed from the Plants that bore them. For, not to mention, that Apples, gathered somewhat before the time, by lying in heaps, do usually obtain a mellowness, which seems to be a kind or degree of Maturation; or that Medlars, gathered whilst they are hard and harsh, do become afterwards in process of time soft and better tasted; in which state though some say they are rotten, yet others think that supposed rottenness is the proper Maturity of that kind of Fruit: Not to mention these, I say, or the like Instances, 'tis a famous Assertion of several Writers of the Indian affairs, that the Fruit they call *Bananas* is usually gathered green, and hung up in bunches or clusters in the house, where they ripen by degrees,

grees, and have an advantageous change made both of their colour and of their taſt. And this an ancient acquaintance of mine, a literate and obſerving perſon, of whom I inquired about it, aſſured me, he had himſelf lately tried and found to be true in *America*. And indeed I ſee not, why a convenient degree of warmth, whether external from the Sun and Fire, or internal from ſome degree of fermentation or analogous inteſtine Commotion, may not (whether the Fruit be united to the Plant or no) put the ſaporifick Corpuſcles into motion, and make them, by various and inſenſible tranſcurſions, rub againſt each other, and thereby make the little bodies more ſlender or thin, and leſs rigid, or cutting and harſh, than they were before, and by various motions bring the Fruit they compoſe to a ſtate wherein it is more ſoft in point of conſiſtence, and abound in Corpuſcles leſs harſh and more pliable, than they were before, and more congruous

to

to the pores of the organ of Taſt: And, in a word, make ſuch a change in the conſtitution of the Fruit, as men are wont to expreſs by the name of *Maturity*. And that ſuch Mechanical changes of Texture may much alter the Qualities, and among them the Taſt of a Fruit, is obvious in bruiſed Cherries and Apples, which in the bruiſed parts ſoon come to look and taſt otherwiſe than they did before. The poſſibility of this is alſo obvious by *Wardens*, when ſlowly roaſted in embers with ſo gentle a fire, as not to burn off the paper they are wont to be wrapt in, to be kept clean from the aſhes. And I have ſeen, in the bordering Country betwixt *France* and *Savoy*, a ſort of Pears, (whoſe name I now remember not,) which being kept for ſome hours in a moderate heat, in a Veſſel exactly cloſed, with embers and aſhes above and beneath them, will be reduced to a juicy Subſtance of a lovely red colour, and very ſweet and luſcious to the taſt. Many other ſorts

of Fruit in other Countries, if they were handled after the same way, or otherwise skilfully wrought on by a moderate heat, would admit as great alterations in point of taſt. Neither is that ſort of Pear to be here omitted, which by meer Compreſſion, duly ordered, without external heat, will in a few minutes be brought to exchange its former hardneſs and harſhneſs for ſo yielding a Contexture and pleaſant a taſt, as I could not but think very remarkable. And that even more ſolid and ſtubborn Salts than thoſe of Vegetables, may have the ſharpneſs and piercingneſs of their taſts very much taken off by the bare internal action of one part upon the other, without the addition of any ſweetning body, I have been induced to think by having found, upon trial, that, by the help of inſipid Water, we may, without any violence of Fire, reduce Sea-ſalt into a Brine of ſo mild and peculiar (I had almoſt ſaid) pleaſant a taſt, that one would ſcarce ſuſpect what it had been,

been; or believe that so great a change of a Mineral body could be effected by so slight an intestine Commotion as indeed produced it; especially, since the alteration of tasts was not the most considerable that was produced by this Operation.

As to Liquours that come from Vegetables, the emerging of new *Sapors* upon the intestine Commotion of the saporifick parts, as Consequences of such Commotions, is more obvious than is commonly considered in the juice of Grapes, which, from a sweet and spiritless Liquour, do by that internal motion we call Fermentation, acquire that pleasing pungency and briskness of tast that belongs to Wine, and afterwards degenerates into that acid and cutting tast that is proper to Vinegar; and all this, by a change of Constitution made by the action of the parts themselves on one another, without the help of any external additament.

FINIS.